**Loop-Based Programming for Repetitive Tasks**

**Objective:**

By the end of this activity, you will be able to write simple loop-based programs using **for** and **while** loops. You will also combine loops with control structures like **if-else** and **switch** statements to automate repetitive tasks.

**Step 1: Using a For Loop to Calculate Total Scores**

You are developing a program for a quiz system to calculate the total score of a student based on individual quiz scores. The scores are stored in an array, and you need to use a **for** loop to sum them up.

**Instructions**:

1. Define an array named **scores** containing the integers 85, 90, 78, 92, and 88.
2. Use a **for** loop to iterate over each element in the array and calculate the total score.
3. Print the total score using **Console.WriteLine()**.

**Сode:**

**namespace** **Loop\_Based**

{

**public** **class** **Step1TotalScore**

{

**public** **static** **void** **Run**()

{

**int**[] scores = [**85**, **90**, **78**, **92**, **88**];

**int** totalScore = **0**;

**for** (**int** i = **0**; i < scores.Length; i++)

{

totalScore += scores[i];

}

Console.WriteLine($"Total Score: {totalScore}");

}

}

}

**Step 2: Using a While Loop to Calculate Factorials**

Create a program that calculates the factorial of a given number using a while loop. The program should ask the user for an integer and then calculate its factorial.

**Instructions:**

1. Declare an integer variable number and set its value to 5.
2. Use a while loop to calculate the factorial of the number.
3. After each iteration, decrement the value of number.
4. Print the factorial using Console.WriteLine().

**Code:**

**namespace** **Loop\_Based**

{

**public** **class** **Step2CalcFactorials**

{

**public** **static** **void** **Run**()

{

**int** number = **5**;

**int** factorial = **1**;

**while** (number > **0**)

{

factorial \*= number;

number--;

}

Console.WriteLine($"Factorial: {factorial}");

}

}

**}**

**Step 3: Combining Loops and If-Else to Determine Pass or Fail**

Write a program that uses a for loop with an if-else structure to check if each student's score meets the passing criteria. A student passes if their score is 50 or above.

**Instructions:**

1. Define an array named studentScores containing the integers 45, 60, 72, 38, and 55.
2. Use a for loop to iterate over each element in the array.
3. Inside the loop, use an if-else statement to check if the score is 50 or above.
4. Print "Pass" if the score is 50 or above; otherwise, print "Fail."

**Code:**

**namespace** **Loop\_Based**

{

**public** **class** **Step3PassOrFail**

{

**public** **static** **void** **Run**()

{

**int**[] studentScores = { **45**, **60**, **72**, **38**, **55** };

**for** (**int** i = **0**; i < studentScores.Length; i++)

{

**if** (studentScores[i] >= **50**)

{

Console.WriteLine($"Score: {studentScores[i]} - Pass");

}

**else**

{

Console.WriteLine($"Score: {studentScores[i]} - Fail");

}

}

}

}

}

**Step 4: Combining Loops and Switch Statements for Task Scheduling**

Create a program that schedules weekly tasks using a switch statement inside a for loop to assign a task for each day.

**Instructions:**

1. Define an array named weekDays containing the strings "Monday," "Tuesday," "Wednesday," "Thursday," "Friday."
2. Use a for loop to iterate over each element in the array.
3. Inside the loop, use a switch statement to assign a task to each day:
   * If it's "Monday," print "Team Meeting."
   * If it's "Tuesday," print "Code Review."
   * If it's "Wednesday," print "Development."
   * If it's "Thursday," print "Testing."
   * If it's "Friday," print "Deployment."

**Code:**

**namespace** **Loop\_Based**

{

**public** **class** **Step4ComboLoopsSwitch**

{

**public** **static** **void** **Run**()

{

**string**[] weekDays = { "Monday", "Tuesday", "Wednesday", "Thursday", "Friday" };

**for** (**int** i = **0**; i < weekDays.Length; i++)

{

**string** day = weekDays[i];

Console.Write($"{day}: ");

**switch** (day)

{

**case** "Monday":

Console.WriteLine("Team Meeting");

**break**;

**case** "Tuesday":

Console.WriteLine("Code Review");

**break**;

**case** "Wednesday":

Console.WriteLine("Development");

**break**;

**case** "Thursday":

Console.WriteLine("Testing");

**break**;

**case** "Friday":

Console.WriteLine("Deployment");

**break**;

**default**:

Console.WriteLine("No task assigned.");

**break**;

}

}

}

}

}

**Main:**

**namespace** **Loop\_Based**

{

**class** **Program**

{

**static** **void** **Main**(**string**[] args)

{

Console.WriteLine("Running Task 1: Total Score");

Step1TotalScore.Run();

Console.WriteLine("\nRunning Task 2: Factorial");

Step2CalcFactorials.Run();

Console.WriteLine("\nRunning Task 3: Pass or Fail");

Step3PassOrFail.Run();

Console.WriteLine("\nRunning Task 4: Weekly Task Scheduler");

Step4ComboLoopsSwitch.Run();

}

}

}